
Off-Hook Queuing

Off-Hook queuing is a software feature that can be equipped at an ESN node and/or ESN main. The feature enables a call originator to remain off-hook for a short time (customer programmable) until a network facility for call completion becomes available at the ESN node or ESN main.

Eligibility

Network calls may be placed in an OHQ if all trunk routes (entries) in the initial route set of a route list (see Note) are busy, and the following criteria are met:

- OHQ has been allowed for that customer group.
- At least one of the trunk routes in the initial route set of a route list is defined as being eligible for OHQ.
- The NCOS of the call originator (at an ESN node or an ESN main) is defined to permit OHQ.
- The incoming trunk group at the ESN node or ESN main is defined in software to permit OHQ for incoming calls. Route Data Block
- The TCM received at the ESN node from an ETN switch is compatible with a FRL that is defined to permit OHQ.
- The TCOS received at the ESN node from another ESN node is compatible with an FRL that is defined to permit OHQ.
- The probability that the call times out in the OHQ before a trunk becomes available is below a specific threshold.
- The OHQ feature is enabled.

Note: A marker determines which route list entries are in the initial route set (see automatic least cost routing). Typically, the initial route set contains the cheaper routes to a particular destination. The remaining routes in the route list, if any, comprise the extended route set and are usually the more expensive routes to the destination. Only routes in the initial route set should be defined to allow OHQ. OHQ are not offered by routes in the extended route set even if they are defined to allow OHQ.

Calls which do not meet the preceding requirements for OHQ eligibility can be offered CBQ at this point.

Availability

The OHQ software performs an “availability” test to prevent calls from entering the OHQ when there is a high probability that the call will timeout before a trunk becomes available. The following process is used to make this test:

- For each trunk route, a counter is maintained which reflects the current number of calls with the maximum queue priority of 3 queued against it. This includes all calls in OHQ, Ring Again, and those CBQ calls that are currently at priority 3 as well as any direct access calls in progress.
- Each trunk route has a threshold value which indicates the maximum number of priority 3 calls that can be queued against it before OHQ timeout becomes a high probability. Before a call is placed in the OBQ, the current queue count is compared with the threshold value for each eligible trunk route in the initial set of routes. If at least one of the trunk routes has a count which is less than or equal to the threshold value, the call is allowed to OHQ against all OHQ eligible routes.

Note: A maximum priority (0, 1, 2, or 3) and a starting priority (0, 1, 2, or 3) are assigned to each user through LD 87. Zero is the lowest priority while three is the highest. Calls are queued according to their starting priority and move to a higher queue (up to their maximum priority) as their promotion timer allows. Once calls reach their maximum priority, they wait for an available trunk in the I set. If the route advance timer (RADT) expires, they can also queue for the extended set routes.

Offer

If all eligibility and availability checks are successful, the call originator is given a distinctive OHQ offer tone (a 1 second burst of 440-Hz tone) when the call enters the OHQ. The call originator either accepts the OHQ offer by remaining off-hook or declines the offer by going on-hook.

OHQ calls are placed in a priority-ordered queue with all other calls waiting for trunks. OHQ calls are assigned the maximum priority (3), since other network facilities may be held while the call is queued. A timer with an initial value equal to the software-defined OHQ time limit is started to limit the duration of the OHQ. The OHQ time limit is service changeable within the range of 2 to 60 seconds.

The queue is examined whenever a trunk becomes idle in a trunk route on which one or more calls are queued. If a call is found which can be terminated on an idle trunk, the available trunk is seized, and the call terminated.

If the OHQ timer expires before the call can be terminated, the call is removed from the OHQ. At this time, the remaining eligible routes in the route list (the extended set) are examined, and the call is either terminated or given standard blocking treatment if no facilities are available. CBQ will not be offered at this point as OHQ was already offered. The ERWT is not given to calls which have been queued, even if terminated on expensive facilities.

OHQ can be offered to call originators located at an ESN node, ESN main, Conventional main or ETN switch. Also, as a call progresses through the network, OHQ can be offered to the call originator from any of the ESN nodes or ESN Mains that are used to process the call. For example, OHQ can be offered more than once for a given call.

Feature interactions

The OHQ feature has the following interactions with existing features:

Call modification

Station users are not allowed to activate call modification features (hold, call transfer, conference) while waiting in the OHQ. Switchhook flash used to activate features from 500/2500 telephones is ignored. Similarly, operation of set feature keys is ignored.

Camp-on, Call waiting

If the attendant extends a call to a telephone that is in the OHQ, the call-waiting tone is not offered to the telephone. If the attendant releases, the call is camped-on the OHQ telephone, but no warning tone is given. When the camp-on call is recalled to the attendant console, the attendant can repeat the camp-on procedure. Once the OHQ call is in an established state, the camp-on tone is provided.

Attendant functions

- The attendant cannot barge-in during trunk seizure for OHQ calls.
- If the attendant extends a network call for a telephone user and the call is offered OHQ, the attendant must inform the caller of the OHQ offer before releasing from the call.
- The attendant is not allowed to operate the release key or another loop key if the source call is in conference and the destination call is in the OHQ. Operation of the release destination key is permitted, however, and causes the OHQ call to be abandoned.